TECHNICAL SPECIFICATIONS

INDEX TO
TECHNICAL SPECIFICATIONS
SALMON FLY FAS AND PARKING AREA EXPANSION

FWP# 7153713

DIVISION 2 SITE WORK

PLAN SHEETS

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Owner and Contractor Responsibilities
B. Contractor use of site and premises.
C. Scope of Work

1.2 OWNER AND CONTRACTOR RESPONSIBILITIES

A. Owner's Responsibilities:
   1. Survey staking of boat ramp. Owner will provide necessary horizontal and vertical control.

B. Contractor's Responsibilities:
   1. Quality control of work.
   2. Coordination with FWP Engineer Kevin McDonnell

1.3 CONTRACTOR USE OF SITE

A. Limit use of site to allow:
   1. Coordinate with FWP to limit public usage in work areas as necessary.

1.4 SCOPE OF WORK

A. Project Objective: The objective of this project is to replace the existing boat ramp with a new cast-in-place ramp and push-in slab.

B. Scope of Work: Work includes the following but is not limited to the general description contained herein:

BASE BID ITEMS:

1. Mobilization: shall include all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies to the site; establishment of general facilities for the contractor's operations at the site including; premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable.

2. Excavation: All materials and work required to: completely remove trees and brush which conflict with the parking area expansion or the new road, stripping of top soil, rough grading of road and parking area, excavation of parking island, establishment of best management practices, and any other unclassified excavation. Contractor to dispose of woody brush, trees and excess top soil in

a safe and legal manner.

3. Base Course (Pit Run): All materials and work to complete installation of base coarse gravel on parking and roads per plans and specifications.

4. Crushed Surfacing: All materials and work required to install crushed surfacing per plans and specifications.

5. Streambank Stabilization Section: All work and materials required to install the rip-rap, top soil and erosion control fabric, and seed per plans and specifications including any additional related excavation.

6. Seeding: All materials and labor to seed areas disturbed by construction and areas designated for seeding per plans and specifications.

7. Parking Blocks: All materials and labor to install approved 6' concrete parking blocks per plans and specifications.

8. Barrier Rocks: All materials and labor to install barrier rocks per plans and specifications.

CONTRACTS: All work shall be done under one general contract.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality assurance and control of installation.

B. References

C. Inspection and testing laboratory services.

1.2 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply fully with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.3 REFERENCES

A. Conform to reference standard by date of issue current on January 1, 2005.

B. Should specified reference standards conflict with Contract Documents, or Regulations request clarification for Architect/Engineer before proceeding.

C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.4 INSPECTION AND TESTING LABORATORY SERVICES

A. Owner will appoint, employ, and pay for services of an independent firm to perform inspection and testing.

B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Architect/Engineer.

C. Reports will be submitted by the independent firm to the Architect/Engineer, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

D. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Architect/Engineer. Payment for retesting will be charged to the Contractor.

E. An Independent Firm shall deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.

F. The Contractor shall cooperate with laboratory personnel, and provide access to the work.

G. The Contractor shall provide incidental labor tools and facilities to provide access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

H. The Contractor shall notify Architect/Engineer and laboratory 48 hours prior to expected time for operations requiring inspection and testing services.

I. The Contractor may arrange with laboratory and pay for additional samples and tests desired by Contractor beyond specified requirements.

OWNER

A. Engineer will perform periodic field inspections to determine if testing is required.

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selection and payment.

B. Contractor submittals.

C. Laboratory responsibilities.

D. Laboratory reports.

E. Limits on testing laboratory authority.

F. Contractor responsibilities.

G. Schedule of inspections and tests.

1.2 REFERENCES

A. ANSI/ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.3 SELECTION AND PAYMENT

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A. The Owner shall employ the services of an independent testing laboratory to perform specified inspection and testing, if required to do so by FWP Engineer. If the testing agency results indicate the material or work meets the related specifications, the cost of the testing will be paid by the Owner.

B. Employment of testing laboratory shall in no way relive Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.4 QUALITY ASSURANCE

A. Comply with requirements of ANSI/ASTM E329 and ANSI/ASTM D3740.

B. Laboratory: Authorized to operate in state in which Project is located.

C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

1.5 LABORATORY RESPONSIBILITIES

A. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.

B. Ascertain compliance of materials and mixes with requirements of Contract Documents.

C. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or Products.

1.6 LABORATORY REPORTS

A. After each inspection and test, promptly submit two copies of laboratory report to Architect/Engineer, and to Contractor.

B. Include:

1. Date issued,
2. Project title and number,
3. Name of inspector,
4. Date and time of sampling or inspection,
5. Identification of product and Specifications Section,
6. Location in the Project,
7. Type of inspection or test,
8. Date of test,
9. Results of tests,
10. Conformance with Contract Documents.

B. Provide interpretation of test results to Engineer.

1.7 LIMITS ON TESTING LABORATORY AUTHORITY

A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. Laboratory may not approve or accept any portion of the Work.

C. Laboratory may not assume any duties of Contractor.

D. Laboratory has no authority to stop the Work.

1.8 CONTRACTOR RESPONSIBILITIES

A. Correct any and all material deficiencies for failing test results.

B. Contractor responsible for payment of all retesting.

END OF SECTION

SECTION 02110

SITE CLEARING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Remove surface debris.

B. Clear only areas designated for construction of plant life and grass.

C. Tree and shrub removal.

D Topsoil excavation.

E. Measurement and Payment

1.2 REGULATORY REQUIREMENTS

A. Conform to State and County codes for disposal of debris and burning debris on site.

B. Coordinate clearing Work with utility companies.

PART 2 EXECUTION

2.1 PROTECTION

A. Locate, identify, and protect utilities that remain, from damage.

B. Protect trees, plant growth, and features designated to remain, as final landscaping.

2.2 CLEARING

A. Clear areas required for access to site and execution of Work.

B. Remove root system of woody plants to a depth of 24 inches below finished grade.

C. Clear undergrowth and deadwood, without disturbing subsoil.

2.3 REMOVAL

A. Remove extra top soil, rock, and extracted plant life to designated area.

B. Dispose of any additional material according to local regulations.

2.4 TOPSOIL EXCAVATION

A. Excavate and stockpile topsoil from all areas that are to receive fill or further excavation.

B. Stockpile location to be approved by Engineer.

2.5 MEASUREMENT AND PAYMENT

A. The work described in Section 02110 will be incidental to the Excavation. See Item #2 on the Bid Proposal Form and Section 01010 Summary of Work

END OF SECTION

SECTION 02207

AGGREGATE MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. References

B. Submittals

C. Aggregate materials and engineering fabric

D. Source quality control

E. Stockpiling

F. Stockpile clean up

1.2 RELATED SECTIONS

A. Section 02211 - Rough Grading.

B. Section 02231 - Aggregate Courses.

1.3 REFERENCES

A. AASHTO - M147 - Materials for Aggregate and Soil-Aggregate.

B. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

C. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, using 5.5 lb. (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

D. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

E. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.4 SUBMITTALS

A. Submit laboratory test results for each type of aggregate material 15 days prior to installation, for Project Manager approval.

1. Each aggregate material used as a base or surfacing material shall have as a minimum the following laboratory tests completed:

I. Sieve Analysis
II. Proctor
III. Atterberg Limit Test (crushed top surfacing only)

B. Materials Source: Submit name of imported materials suppliers. Provide materials from same source throughout the work. Change of source requires retesting at the Contractor's expense.

C. Change of source requires Engineer's approval.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS AND ENGINEERING FABRIC

A. Pit run base course, 3" (-) free of shale, clay, friable material and debris; graded in accordance with AASHTO T-11 and T-27, within the following limits:

TABLE OF GRADUATIONS
Percentage of Weights Passing Square Mesh Sieves

	Grade 1
3 Inch Sieve	100%
No. 4 Sieve	25-60%
No. 200 Sieve	2-10%

1. Material shall be evenly graded.
2. 5% oversized material is permitted.

:

B. Crushed Top Surfacing; free of silt, lumps of clay, loam, friable or soluble materials, and organic matter; graded in accordance with ANSI/ASTM C136; within the following limits:

TABLE OF GRADUATIONS
Percentage by Weights Passing Square Mesh Sieves

Passing	% Passing
1”	100 %
3/4”	
1/2”	
3/8”	
#4	40% - 70%
#10	25% - 55%
#16	
#30	
#50	
#100	
#200	5% - 12%

The aggregate for all grades, including added binder or filler, shall meet the following supplemental requirements.

(1) Dust Ration. The portion passing the No. 200 Sieve shall not be greater than 2/3 of the portion passing the No. 40 Sieve.

(2) The liquid limit for that portion of the fine aggregate passing a No. 40 Sieve shall not exceed 25 and the plasticity index (PI) shall be less than six, as determined by AASHTO T-89 and T-90.

(3) No intermediate sizes for cover aggregate, or for other purposes, shall be removed from the material in the course of production unless authorized in writing by the Architect/Engineer.

(4) The material shall meet all the requirements of this section when it arrives on the project site. Windrow mixing of different materials to obtain the specified material will not be allowed. If bentonite is to be added, it shall be done in a method approved by the Engineer.

(5) At least 50% by weight of the aggregate retained on the No. 4 sieve must have

at least one mechanically fractured face.

2.2 SOURCE QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of General Conditions and Special Provisions.

B. Tests and analysis of aggregate material will be performed in accordance with AASHTO T-11 and T-27 and as specified in this Section.

C. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.1 STOCKPILING

A. Stockpile materials on site at locations approved by Engineer.

B. Separate differing materials with dividers or stockpile apart to prevent mixing.

C. Stockpile in sufficient quantities to meet project schedule and requirements.

D. Direct surface water away from stockpile site so as to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

A. Remove stockpile, leave area in a clean, neat condition reseed as necessary. Grade site surface to prevent freestanding surface water.

END OF SECTION

SECTION 02211

ROUGH GRADING

PART 1 GENERAL

1.1 SECTION INCLUDE

A. Removal of topsoil and subsoil.
B. Excavating, grading, filling and rough contouring the site for parking area and boat ramp construction.
C. Measurement and Payment

1.2 RELATED SECTIONS

A. Section 01410 - Testing Laboratory Services: Testing fill compaction.
B. Section 02110 - Site Clearing
C. Section 02207 - Aggregate Materials.

1.3 REFERENCES

A. AASHTO T180 - Moisture-Density Relations of Soils using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.

B. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

PART 2 EXECUTION

2.1 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Notify utility companies to locate buried utilities.

D. Locate, identify, and protect utilities that remain from damage.

2.2 TOPSOIL AND SUBSOIL EXCAVATION

A. Excavate topsoil and subsoil from marked areas.

B. Stockpile topsoil in area approved by Engineer.

C. Topsoil will be blended into landscape and seeded, or used for reclamation on site. See Section 02936

2.3 FILLING

A. Fill areas to contours and elevations with unfrozen materials.

B. Place fill materials on continuous layers and compact. See Section 02231

C. Maintain optimum moisture content of fill materials to attain required compaction density. Compact to minimum 90 percent of maximum density.

D. Make grade changes gradual. Blend slope into level areas.

2.4 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed as necessary by the Engineer. Compaction testing will be performed in accordance with ASTM D2922. If determined necessary by the FWP Engineer.

B. Placement of base aggregate and subsequent road surfacing shall not commence until Engineer has been notified and has had 48 hours to inspect rough grading.

2.5 MEASUREMENT AND PAYMENT

A. The Rough Grading described in Section 02211 shall be included under Excavation Bid Item #2 on the Bid Form.

END OF SECTION

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SECTION 02231

AGGREGATE COURSES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aggregate courses.

1.2 RELATED SECTIONS

A. Section 01025 - Measurement and Payment: Requirements applicable to lump sum.

1.3 REFERENCES

A. AASHTO T180 - Moisture-Density Relations of Soils using a 10lb (4.54 kg) Rammer and an 18 in. (457mm) Drop.

B. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

C. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

PART 2 PRODUCTS

2.1 SURFACING MATERIALS

A. 1 inch minus Crushed Top Surfacing (CTS): As specified in Section 02207.
B. 3 inch minus pit run: As specified in Section 02207.

PART 3 EXECUTION

3.1 AGGREGATE PLACEMENT

A. Spread material over prepared substrate to a total compacted thickness indicated for each material. A vibratory roller is suggested for compaction. Compact to minimum 90 percent of maximum density.

B. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

C. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.2 TOLERANCES

A. Flatness: Maximum variation of 1/10 foot in 10 feet measured along existing slope.

B. Scheduled Compacted Thickness: Within 1/4 inch of designated thickness.

C. If tests indicate Work does not meet specified requirements, Project Manager may at his discretion direct the Contractor to rework the material and retest or remove work, replace and retest.

3.3 FIELD QUALITY CONTROL

A. Contractor will be responsible for field quality control.

B. Compaction testing will be performed in accordance with ASTM D2922.

C. If tests indicate Work does not meet specified requirements, recompact and retest or at Engineer's discretion, remove Work, replace and retest.

3.4 MEASUREMENT AND PAYMENT

A. All material and labor described in this section shall be bid and compensated under the associated material as listed on the bid form.

END OF SECTION

RIPRAP

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Riprap

1.2 QUALITY ASSURANCE

A. Material must be obtained from a Montana Department of Environmental Quality permitted source. The DEQ permit number shall be submitted before installation.

B. Riprap. The stone shall be handled or dumped on the designated slopes to form the specified cross section. The smaller stone shall be uniformly distributed throughout the work. The rock shall be manipulated by hand or machine methods sufficiently to secure a uniform surface and mass stability. Unless otherwise specified, riprap thickness shall be 2 foot measured perpendicular to the slope and the riprap shall extend from the toe of the slope to the elevation shown on the plans.

PART 2 PRODUCTS

2.1 MATERIALS

A. Riprap Materials: Provide Class I Riprap. No more than 10% of the stone will have a diameter great than 12", no more than 50% of the stone will have a diameter less than 10", and no more than 10% of the stone will have diameter of less than 6".

B. Provide stone that is hard, durable and angular in shape, resistant to water action and weathering, free from overburden, spoil, shale, structural defects and organic material.

C. Each stone must have its greatest dimension not greater than three times its least dimension.

D. Do not use rounded stone or boulders from a streambed source as rip-rap. Do not use shale or stones with shale seams.

PART 3 EXECUTION

3.1 PLACEMENT

A. Angular faces shall inter-lock to provide stable surface.

B. Place riprap along edges of concrete boat ramp where shown.

C. Installed Thickness: 1 ft average.

D. Fill voids with top soil stored from site excavation.

END OF SECTION

SECTION 02936

SEEDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Measurement and Payment

B. Quality assurance

C. Delivery storage and handling of seed and fertilizer

D. Seed mixture

E. Soil materials

F. Fertilizer

G. Examination of soil base

H. Substrate preparation

I. Placing topsoil

J. Fertilizing

K. Seeding

L. Maintenance

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Grassed Areas:
   1. Basis of Measurement: Not measured. Lump Sum. See Bid Item #6 on the Bid Form.
   2. Basis of Payment: Lump Sum. Includes preparation of topsoil and seeding.
   3. Seed and Fertilize those areas disturbed by construction and areas of existing roads

and parking that are outside of the new roads and parking areas.

1.3 REFERENCES

A. FS O-F-241 - Fertilizers, Mixed, Commercial.

1.4 DEFINITIONS

A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Knapweed, Horsetail, Morning Glory, Rush Grass, Mustard, Leafy Spurge, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel and Brome Grass.

1.5 QUALITY ASSURANCE

A. Provide seed mixture in containers showing percentage of pure live seed, seed mix, year of production, net weight, date of packaging, and location of packaging.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products such that they are stored in a weatherproof, dry, rodent free location in such a manner that it will not be damaged or its usefulness impaired.

B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.7 SEED MIXTURE (By Weight)

A. <u>Native Grass Seed Shall Be: % By Weight</u>

Western Wheatgrass	40%
Slender Wheatgrass	25%
Canadian Bluegrass	25%
Hard Fescue	10%

B. All seed shall comply with and be labeled in accordance with the Montana Seed Law. Seed shall have been grown in the North American Continent, in an area having climatic conditions and elevation similar to area of use. All seed should be of standard grade. The seed may be rejected by the Project Manager if the point of origin and production is not suitable.

1.8 SOIL MATERIALS

A. Topsoil: Excavated from site and free of excess vegetation.

1.9 FERTILIZER

A. Fertilizer: Recommended for native grass in proportions to meet requirements for actual nitrogen and phosphate as outlined in Section 2.4.A.

B. Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.

PART 2 EXECUTION

2.1 EXAMINATION

A. Verify substrate base has been contoured and compacted.

B. If there is not enough topsoil for total area, the Engineer shall prioritize areas of topsoil.

2.2 SUBSTRATE PREPARATION

A. Eliminate uneven areas and low spots.

B. Remove debris, roots, branches, stones, in excess of 1 inch in size. Remove subsoil contaminated with petroleum products.

C. Scarify subgrade to depth of 3 inches where topsoil is to be placed. Scarify in areas where equipment is used for hauling and spreading topsoil and has compacted subsoil.

2.3 PLACING TOPSOIL

A. Place topsoil in disturbed areas to a nominal compacted depth of 2 inches. Place topsoil during dry weather.

B. Fine grade topsoil eliminating rough or low areas. Maintain profiles and contour of subgrade.

C. Remove roots, weeds, rocks and foreign material while spreading.

D. Manually spread topsoil close to trees and plants to prevent damage.

E. Lightly compact placed topsoil.

F. Place excess topsoil on obliterated roadways.

G. Leave stockpile area and site clean and raked, ready to receive landscaping.

H. All topsoiled areas shall be "garden raked" after seeding to remove the debris and wheel tracks. The final surface shall be smooth.

2.4 FERTILIZING

A. Furnish fertilizer at the rate of 30 pounds actual nitrogen and phosphate per acre. Fertilizer shall be evenly applied to native grass areas which are to receive seed at the rate of 30 pounds of actual nitrogen and phosphate per acre and worked lightly into the top one inch of soil in such a way as to make a finely pulverized seedbed approximately 48 hours prior to seeding. This operation may be accomplished by broadcast and hand raking or drilling with a fertilizer drill.

B. Apply after smooth raking of topsoil.

C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.

D. Lightly water to aid the dissipation of fertilizer.

2.5 SEEDING

A. Grass seed shall be sown at the rate of 25 pounds pure live seed per acre on native grass areas using broadcast methods.

B. Planting Season: Fall, after August 15th or spring prior to May 1.

C. Do not sow immediately following rain, when ground is too dry, or during windy periods. Wind speed should not exceed 5 mph.

D. All disturbed areas shall be fertilized and seeded unless otherwise directed.

2.6 MAINTENANCE

A. Immediately reseed areas which show bare spots.

B. Protect seeded areas from traffic or pedestrian use with warning barricades or other Engineer approved methods.

END OF SECTION

SECTION 02950

EROSION CONTROL FABRIC

PART 1 GENERAL

1.1. DESCRIPTION

A. The Work covered by this section includes the furnishing of all labor, materials, equipment and incidentals for construction and installation of Erosion Control Fabric on designated surfaces adjacent to the boat ramp improvement project.

PART 2 MATERIALS

2.1. EROSION CONTROL FABRIC

Coir fabric is a biodegradable erosion control fabric made from the fibers of coconut husks. Woven coir fabric is used as erosion control of floodplain surfaces.

A. COIR FABRIC MATERIAL PROPERTY REQUIREMENTS AND DIMENSIONS

1. The woven coir fabric material shall consist of 100% coconut fiber in continuously woven mat. The material shall conform to the following values:
Thickness ASTM D1777 0.30 in. (min)
Tensile Strength (dry) ASTM D4595 60 x 60 lb./in. (min)
Mass Per Unit Area ASTM D3776 13 oz./sy. (min)
Open Area Measured 65% (max)
Roll Width Measured 9.84 ft. (min)

B. PREAPPROVED PRODUCTS

1. The following products have been pre-approved. Do not order, deliver, or install other products without the written approval of the Engineer.

2. Woven coir fabric shall be DeKoWe 400, Nedia KoirMat 400, Rolanka BioDMat 40 or approved equal.

3. The straw wattle material shall be North American Green WS925 or approved equal.

C. SUBMITTALS

1. Name, address, and phone number of supplier(s) of all coir fabrics used on the project.
2. Technical Specification of the coir fabrics and straw wattle with associated testing standards with 8 by 10 inch samples in plastic bags.
3. Documentation of equivalency to products specified.
4. Dimensional sizes of delivered products.
5. Manufacturer's shipping, storing, and placement recommendations.

D. MATERIALS HANDLING AND STORAGE

1. Store all coir fabric and straw wattle elevated off the ground and insure that it is adequately covered to protect the material from damage. Protect fabric from sharp objects that may damage the material. Materials damaged during transport, storage or placement shall be replaced at the Contractor's expense.

2.2. WOODEN STAKES

A. Fabric stakes shall be wooden stakes 12 inches long and 1 inch by 0.75 inches in diameter, or other dimensions as approved by the Engineer. Fabric stakes shall not be treated with preservative. Other types of stakes shall be subject to the approval of the Engineer.

PART 3 EXECUTION

3.1. EROSION CONTROL FABRIC

A. This section describes the placement of woven coir fabric as Erosion Control Fabric on surfaces designated on the Plan Sheets and by the FWP Engineer.

B. Install Erosion Control Fabric as described in this section.

C. Seeding of the topsoil shall be carried out prior to installation of Erosion Control Fabric as described in Seeding.

D. Before placing Erosion Control Fabric, the topsoil surface on which it is to be placed shall be prepared by removal of all sharp objects. All holes and large ruts shall be filled with material.

E. The Contractor shall handle the fabric in a manner that does not damage the fabric. Place Erosion Control Fabric rolling the fabric lengthwise, parallel to the channel. Erosion Control Fabric shall be unrolled directly on the prepared surface.

F. Erosion Control Fabric shall be placed in parallel rows oriented in a downstream direction. End joints from one row to the next shall be offset by a minimum of 10 feet. Fabric end joints shall be overlapped in an upstream to downstream direction to prevent flowing water from dislodging the fabric. Fabric parallel joints shall be overlapped in a nearest to channel over farthest to channel direction to prevent flowing water from dislodging the fabric. All joints between fabric rolls shall consist of a minimum of 12 inches of fabric overlap.

G. The Erosion Control Fabric shall be even, smooth, and taut, such that the fabric is in direct contact with the underlying soil in all areas, and to the satisfaction of the Engineer. Mechanical tightening may be required to remove slack.

H. Install Fabric Stakes along all edges, overlaps and at intervals as specified herein or as approved by the Engineer. Install Fabric Stakes at 4-foot spacing along all seams and at 4-foot spacing within fabric rolls, staggered with respect to seams. Do not cut woven coir fabric to install stakes: thread stakes between fabric strands. Stakes may be tilted up to 45degrees with respect to vertical if underlying materials prevent vertical insertion. After insertion, stake tops shall protrude 2 inches maximum above the adjacent fabric surface. Broken, split, or damaged stakes shall be removed and replaced at the Contractor’s expense.

3.2. ENGINEER INSPECTION AND APPROVAL

A. Engineer shall approve the floodplain surface prior to the placement of the Erosion Control Fabric.

PART 4 MEASUREMENT AND PAYMENT

4.1. MEASURE

A. The quantity of Erosion Control Fabric shall be the actual fabric surface treatment area computed in square feet as the product of the measured length and width of exposed Erosion Control Fabric as seen in plan view, to the nearest 10 square feet. Overlapped fabric shall not be measured for payment.

4.2. PAYMENT

A. Payment for Erosion Control Fabric placed over reclaimed surfaces shall be made by unit cost basis. The unit cost per each square foot for Erosion Control Fabric shall constitute full compensation for all materials, staking, labor, Equipment, and incidentals necessary to furnish materials and for installation as

specified in the specifications and on the Plan Sheets. Refer to Bid Item #5 on the bid form.

END OF SECTION